

University of Cincinnati

EDUCATION AND RESEARCH
CENTER FOR OCCUPATIONAL
SAFETY AND HEALTH

SUMMARY ANNUAL REPORT

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NIOSH Training Grant

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SUBMITTED BY:

Carol Rice, Ph.D., CIH

CENTER DIRECTOR

University of Cincinnati

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Program Description

The University of Cincinnati (UC) Education and Research Center (ERC) provides education, consultation, community service and research for workers, employers and residents throughout our DHHS region of Ohio, Indiana, Illinois, Michigan, Wisconsin and Minnesota, across the United States and in several other countries. The ERC has a full complement of Core Programs—Occupational Health Nursing, Occupational Hygiene, Occupational Medicine Residency, Occupational Safety and Health Engineering. The ERC provides three component training programs—Biomonitoring, Hazardous Substances Academic Training, and Pilot Research Training Program. Continuing Education and Outreach involves all of the academic programs.

The UC ERC programs bring together three colleges: Engineering (Occupational Safety and Health Engineering), Medicine (Occupational Hygiene, Occupational Medicine Residency, Biomonitoring, Hazardous Substances, Pilot Research Program, Continuing Education and Outreach), and Nursing (Occupational Health Nursing). All three colleges are within close proximity on a single campus. Dollars provided to the ERC through the National Occupational Research Agenda (NORA) support additional multidisciplinary activities.

Graduate and Continuing Education

Education of MS and PhD students is a critical component of the ERC. The following table shows enrollment and graduation numbers for 2008-09.

Program	Graduated	Enrolled
Occupational Health Nursing	3 MSN; 1 Ph.D	5 MSN; 4 Ph.D.
Occupational Hygiene	1 MS; 2 Ph.D.	8 MS; 6 Ph.D.
Occupational Medicine Residency	None	4 MS
Occupational Safety and Health Engineering	None	3 MS; 4 Ph.D.
Biomonitoring	1 Ph.D.	2 MS; 1 Ph.D.
Hazardous Substances Academic Training	None	5 MS

Continuing Education served 2,076 participants in 144 courses.

NIOSH funding has facilitated several enhancements to the education mission including:

- The NIOSH-approved Spirometry Refresher training program is available to students.
- A multi-disciplinary introduction to occupational health and safety course was developed for nursing, hygiene and medicine students.
- A rural community occupational clinic that serves more than 200 businesses has become an educational partner and offers practicum experiences for core disciplines.

-Occupational health and safety principles have been incorporated into a community nursing practicum, specifically topics on adolescent amusement park workers and use of sun protection.

-Critical reviews of current research topics have been added to the Hygiene seminar series.

-Hazardous materials experiences included a mock disaster showcasing the Sandia real-time plume dispersion software, sampling approaches and the command center, hands-on experience with remotely-operated robot samplers and a communication exercise using radios.

-The EPA building checklist and air quality, building moisture and structure ventilation have been introduced in a laboratory exercise.

- r2p has been introduced into several courses.

Interdisciplinary interaction among students occurs at many levels at the UC ERC. Selected opportunities funded through NORA research training support are:

-A mini-conference on human exposure to noise and vibration involved UC, NIOSH, USAir Force and local industry.

-Organization of a rural hospital-based occupational medicine practice was described by the multi-disciplinary staff; details were given on specific regional exposures, including hydrofluoric acid.

-Unions in Worker Health and Safety was the topic of a day-long workshop exploring contributions of organized labor to improvements in the workplace. Labor leaders, a labor lawyer and a former head of OSHA lead the session that included break-out sessions. ERC students and faculty attended the local Workers' Memorial Day the evening before the workshop.

-The Pilot Research Training Project Symposium, provides meeting and discussion time for all recipients from the ERC and the 11 other participating organizations. These are: Purdue University, Western Kentucky University, University of Kentucky, Eastern Kentucky University, US Air Force Institute of Technology (AFIT), Ohio University, Bowling Green State University, Central State University, Kentucky State University, Murray State University, and University of Toledo-Health Sciences. At the 9th Annual Symposium, 27 presenters described their work to more than 100 attendees. Over the past year, 12 recipients published findings in peer review journals; collectively six grants totaling \$416,701 were obtained by three PRP awardees using data from their pilot investigations. In addition, two faculty members leveraged their experience gained with their PRP projects for obtaining \$18.5 M multi-university Center for nanosensors.

-Five interdisciplinary trips were possible this year using supplemental funds. Twenty-one students and six faculty members participated. Of the students, ten were from Environmental and Occupational Hygiene, five from Occupational Safety and Health Engineering, three from the Occupational Medicine Residency, and three from Occupational Health Nursing. Destinations were: 2008 Ohio Annual Employee Health and Wellness Conference; 17th Annual Ohio Workplace Safety Conference; Oak Ridge National Laboratories; New York/New Jersey ERC Historical Tour that included Lackawana Coal Mine, Rivers of Steel Tour, NIOSH in Pittsburgh, Detroit River Rouge Plant and Michigan Truck Plant, Brush Beryllium and Love Canal; Morgantown and

Beckley Mine Training Academy that included NIOSH in Morgantown, Beckley Mine Training Academy and Beckley demonstration coal mine.

Research—regional relevance translated to practice

Research findings relevant to this region have been reported in the literature, and gained attention in the press, providing much wider distribution to stakeholders. Brief examples from this year follow:

- A new method using neutron activation quantifies occupational exposure of school bus drivers to combustion products in diesel exhaust.
- The contribution of impulsive noise to overall risk in a complex noise environment can be evaluated using a new, validated model.
- Exposure to diacetyl in the workplace can be associated with airway obstruction.
- Long-term exposures to refractory ceramic fibers have not been associated with progressive decrements in lung function.
- A perception of increased workload is associated with chronic fatigue in hospital nurses.
- Soil lead hazard control measures applied to housing remained intact by visual examination several years after the expected useful life.
- Children living in homes where there was visible mold during infancy were at seven times increased risk of developing asthma, compared with children in mold-free homes.
- Bacterial and fungal particles in agricultural work penetrate a respirator mainly due to face seal leakage.
- Interactive worker training increased the use of work practices to reduce dust exposure during demolition activities.
- Neuromotor effects of manganese have been identified among community residents in a town with environmental contamination.

Many of the results noted above or from previous years led to further funded investigations. For example, additional funds have been received to evaluate the historical vermiculite exposures of lawn care products workers. Also funded is a project to evaluate the effect of ultrafine particles during residential and automobile fires on cardiovascular health among firefighters. A multi-site intervention to reduce violence in hospital emergency departments is underway. Psychometrics of health care productivity for a survey of 10,000 has been funded. Use of an adjustable cart introduced into the retail trade industry is being evaluated for changes in ergonomics symptoms. A new lead project involves evaluation of the feasibility of using field portable X-ray fluorescence analyzers to determine lead on painted toys and other imported products; a second project involves quality control of lead dust wipe sampling protocols used in building risk assessment. The relation between personal bioaerosol exposure and respiratory symptoms in greenhouse workers is being studied.

The University of Cincinnati ERC translates research findings to practice, improving health and reducing health care costs. Selected recent examples are:

- To reduce MRI machine noise exposure to patients and operators, a prototype active control technique has been developed and is being evaluated.
- Diacetyl exposures in several facilities were eliminated using substitution in the formulation.
- A hospital nursing staff orientation developed to increase self-confidence in management of environmental risks and decrease injury rates among new employees was implemented.
- A Health and Safety fair was conducted for over 200 workers by nursing faculty.
- Fact sheets have been designed for Teens in Agriculture and Teens in the Amusement Industry.
- Laboratory safety training was developed and implemented for a public school system.